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Exploring Professional Circus Artists' Experience of Performance-Related Injury and Management: A Qualitative Study

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Abstract

Background – Circus is a physically demanding profession, but injury and help-seeking rates tend to be low.

Objective – This qualitative interview study explores the perceptions and beliefs about injury and help seeking of circus artists.

Methods – Ten professional circus artists (5 females; mean age 33 (range 27-42) years) were enrolled. Individual, semi-structured, audio-recorded, interviews were conducted until data saturation of themes was reached. Data were analysed thematically.

Findings – Four themes were identified: (i) The injured artist; (ii) Professionalism; (iii) Circus life and (iv) Artists' experience of healthcare. Most participants described the circus as central to their lives and injuries had wide-ranging psychosocial consequences. Injury adversely affected participants' mood and threatened their identity. External and personal factors such as the belief that pain was normal pushed participants to use adaptive strategies to perform when injured. Continuous touring and financial constraints affected help-seeking. Easy access to healthcare was rare and participants often self-managed injuries. Experiences of healthcare varied, and participants desired flexible and more accessible approaches to prevention and injury management. A modified version of the *integrated model of psychological response to injury and rehabilitation process* and the concept of identity provided a framework to understand participants.

Conclusion – Injuries had extensive negative consequences. Work schedules, financial factors, employer support, the artists perception of the importance of the show and the relationship between circus and identity influenced injury management and help-seeking. Injury prevention and management strategies could be optimised by developing centres of expertise, online resources and better regulations of the profession.

Introduction

Circus is an increasingly popular art-form that requires both athletic and artistic skills. However, only few health-related circus arts practice and performing guidelines are published (1). The demands of the training and practice required to perform to a high standard can produce deleterious effects on health and well-being (2, 3). The causes of injury during circus performance and training are multifactorial (3) and include psychological factors such as low self-efficacy and fatigue (4, 5) and physical factors such as the exposure to high loads (6) and insufficient resting time (7). As a result, professional circus artists may require frequent medical attention.

Professional circus artists tend to report low injury rates (7.37 to 9.27/1,000 artist exposures) (8) and amateur circus artists are less likely to seek help for an injury than athletes (9). This may be because amateur circus artists underestimate the seriousness and consequences of injury; are fearful of losing performance roles; have low trust in healthcare providers or show higher pain tolerance thresholds (9). Delayed or inappropriate injury management could have considerable physical, emotional, social and financial consequences (10).

The reasons for low reported injury rates in professional circus artists is not known although research in other performance disciplines, such as dance or music, suggest that injuries have negative emotional consequences, that the relationship between the performers' career, body and identity (11) and the relationship between performance and pain is important (12). For example, dancers appear to normalise pain and experience feelings of crisis, loss, shame, guilt and anxiety when injured (12). Similarly, playing-related musculoskeletal disorders in musicians can have devastating physical, emotional, social and financial consequences and threaten musicians' identity (13, 14). For orchestral musicians, injury risk is not only influenced by physical factors, but also by psychosocial factors such as interpersonal relationships and performance-induced stress, as well as difficulties associated with work organization (15). Injuries disrupt musicians' perception of time, space, social relations and body (16, 17) and is considered a sign of weakness, failure, and poor musicianship within orchestras (18, 19). Consequently, this culture encourages musicians to play through considerable pain and conceal injuries (18, 19).

Circus performers, like dancers, require both athletic and artistic skills and consider themselves as artists (20). They also face serious risk of career-threatening injury (21). However the large range of circus disciplines are poorly defined compared to ballet (21), sports or music. Differences in lifestyle, financial status and social relations between circus and other performance arts may limit the transferability of findings from studies conducted on other populations (21). Circus artists are a poorly studied population and may have unique unaddressed needs for the management of their injuries.

Understanding the perceptions and beliefs of circus artists about injury and help seeking is crucial for developing injury prevention programmes and appropriate and accessible care to minimise the impact of injury. There are several models (22) which could be used to understand the psychosocial context related to injuries. One model which has been used in sport psychology (22-25) to explain responses to injuries is Wiese-Bjornstal's integrated model of psychological response to injury and rehabilitation process (26). A central concept of this model is cognitive appraisal, defined as processes through which potentially stressful situations are assessed as being stressful and the individual's evaluation of the extent of that stress. In this model, the behavioural and emotional response to injury is the result of the cognitive appraisal of situational factors (i.e. sport-specific, social and environmental) and personal factors (i.e. injury characteristics and individual differences). Whilst the model may over-simplify relationships between emotions, behaviour, cognitive appraisals and recovery outcomes (22) and some influential factors such as the athletes' essential meaning of the injury may be missing (25), it could provide a basis to investigate the experience of injured circus artists. The concept of athletic identity, the degree to which an individual identifies with the athlete role (27), is another key concept in sports psychology. In sports, a strong athletic identity can have positive consequences, such as a greater likelihood of long-term involvement in exercises behaviour, but it can also lead to greater difficulties in career transitions or injuries (27, 28). There are strong links between identity and career in dancers and musicians (11, 28, 29) and artistic identity may also be important in injured circus artists.

As there is limited research in this population, an exploratory qualitative study is a useful first step. In comparison to questionnaire-based studies, qualitative methods rooted in a constructivist epistemological framework can provide a deeper understanding of the participants' perspective, driven by them rather than by researchers (30). The aim of this study

was to explore the experience of and perceptions about injuries and their management in professional circus artists.

2. Methods

This qualitative study, using semi-structured, in-depth, individual interviews was approved by the King's College Research Ethics Committee (reference BDM/14/15-59).

We recruited English-speaking adults (age ≥ 18 years) who defined themselves as professional circus artists, with existing or previous self-reported performance-related physical injuries. Artists already performing but still training in a circus school program were excluded.

Advertisements with information emphasizing the study purpose was placed on more than 25 Facebook™ circus arts' interest groups and multicast email to the United Kingdom circus community including circus agencies, professional circus teachers, artists and headmasters of professional's circus schools using published email addresses. A purposive sample (31) of participants was recruited by the lead author (TC, MSc student, physiotherapist, male) to capture a range of experiences and views concerning performance-related injuries, this included participants from different circus educational backgrounds (circus school/self-learner/circus family), work settings (part of a company/freelance/traditional or contemporary circus) and geographic locations in the United Kingdom. Participants were recruited until data saturation of themes was reached, defined as no new information obtained from three consecutive interviews (32). This was established by consensus agreement between three investigators (TC; EG, PhD, health psychologist, academic, female; LB, PhD physiotherapist, academic, female).

Participants were invited for individual interviews to be conducted either face to face or via the telephone depending on their preferences and were informed that the interview would be approximately an hour in duration. After providing written informed consent, participants completed a short socio-demographic questionnaire and were interviewed by a single researcher (TC) trained in qualitative method by experienced qualitative researchers (LB, EG) (33-35). TC was a trained non-professional circus artist (thirteen years) and worked as a physiotherapist in a clinic with a special interest in performing arts. Participants had no contact with TC prior to study commencement.

During each interview, TC recorded field notes and impressions of the interview. A reflexive

account was recorded after each interview to ensure that researcher bias was acknowledged and accounted for in analysis. Interviews followed a topic guide developed a priori (table 1). This guide was developed from existing guides, the topics and questions frequently explored in performing arts among dancers (11, 12) and musicians (13, 14, 16, 17). It was then refined by the lead author drawing on his experience in circus arts and in consultation with qualitative researchers. It was refined iteratively after pilot interviews (n=3) and from additional areas of relevance revealed during the on-going analysis. Probe questions explored key topics and new issues.

INSERT TABLE 1 HERE

Audio recorded interviews were transcribed verbatim, anonymised, checked by participants for accuracy and analysed using NVivo 10.2.0 qualitative analysis software (QSR International, Melbourne, Australia) by the lead author. Key stages of thematic analysis (36) were applied including familiarisation with the data and generating codes and themes. Due to the absence of previous literature and the explorative nature of this study, the process of coding was completed using an inductive approach. The lead researcher's own experiences, as a non-professional circus artist ultimately contributed to the interpretation and co-construction of the data (37). The thematic analysis was influenced by constructivism, which accepts that every person's experience of health and illness is unique to them, that knowledge is not value-free, and that subjectivity is part of enquiry (30). Initial codes around similar and interrelated ideas or concepts in respect to the research question were refined into broad supra-ordinate themes and sub-themes. Themes were then reviewed in relation to the entire data set; and in that process some themes were combined, modified, separated or abandoned. Through the analysis, the researchers discussed their findings and opinions until agreement was reached that codes and themes accurately and meaningfully reflected participants' experiences. Finally, findings were member-checked with a sample of participants (n=3) to ensure resonance. The Consolidated criteria for reporting qualitative research checklist (38) was used to report findings.

3. Findings

From 22 eligible people that responded to our advertisements, 20 met the inclusion criteria and 10 participants (5 females and 5 males; mean age 33, range 27-42 years) were enrolled in this study between April and May 2015. One participant initially identified to be was excluded as a

mutually convenient interview date could not be agreed. Data saturation was reached after 7 interviews and confirmed by 3 additional ones. No interviews needed to be repeated and they lasted between 45-70 min. Interviews were conducted face to face in: 4 circus schools, 1 cafe, 1 theatre, 1 participant's home, and 2 were completed remotely by phone. Participants completed a range of circus disciplines (e.g. flying trapeze, hand-to-hand, Cyr wheel), had been performing for an average of 12 years (range 1-28 years) and were members of multiple different companies (table 2). All participants reported at least one current injury or site of pain. They all regularly performed at the time of the interview, except one participant who still trained and taught circus but stopped performing because of chronic pain. A good rapport was established between the interviewer and participants, who spoke freely about their experiences.

INSERT TABLE 2 HERE

Four supra-ordinate themes emerged from the interviews. Fig 1. illustrates how the situational and personal factors associated to an injury influence the cognitive appraisal of circus artists, which leads to their behavioural and emotional response.

1) The Injured Artist

Participants, regardless of their sex, employment status and circus speciality recognized that circus training and performing was more than a job to them but regarded it as their whole life. Consequently, injuries deeply affected them and could lead to negative emotional responses.

1.1 Losing everything

Participants communicated that there was a strong link between how they viewed themselves and their role in the circus, which was commonly likened to a 'home' or a 'family' (06, male, 34 years) even if they worked as solo performers. Consequently, the effect of injury on professional circus artists was considerable and wide-ranging:

"Suddenly everything you've invested in and relied on for so long, isn't there. I find I have very, very little else in my world." (04, male, 31 years)

Overall, participant's mood and emotional states were affected by injuries. This was especially true for injuries perceived as severe. Most participants reported being fearful of the uncertainty

that accompanied major injury and the long-term effect of injury on their career:

“There's always that first little period [...] like: this is going to be it now, this is my career ending injury.” (07, female, 31 years)

This was intensified as few participants had other career options available to them if they were unable to perform. Only one participant had other options beside circus:

“I can always go back to being a teacher.” (09, male, 27 years)

He was less fearful of minor injuries:

“It's ... enough that I feel it when I'm performing but not serious enough that I'm worried about it.” (09, male, 27 years)

For many artists, a severe injury led to periods of low mood and negative emotional states:

“I remember being completely and utterly, like, let's say: down in the dumps.” (08, male, 27 years)

They did not want others to see them injured. This caused a few participants from large companies to withdraw socially and isolate themselves from their peers, which also minimised the envy and jealousy they felt towards those able to perform:

“I became a bit of hermit and kind of just kept myself to myself.” (07, female, 31 years)

A few participants explained that as they routinely performed extraordinary skills and were ‘so active and capable’ (05, male, 31 years), they expressed frustration when they could not complete the less demanding physical and day-to-day tasks they could easily do when they were healthy, such as shopping. Several participants described that being unable to train or perform also made them disorientated and bored:

“You know I'm used to getting up and training every day and when I can't get up and train, I just don't know what to do with myself.” (05, male, 31 years)

Injuries negatively impacted on how participants viewed themselves. Guilt, self-blame and self-hate were experienced by some participants for having to rely on the circus community for support:

“You're a burden on everyone else.” (03, female, 42 years)

1.2 The body as physical capital

Most participants talked about how their bodies were essential to their careers:

“I need my body to work, and just live the life I wanna live.” (03, female, 42 years)

Experienced participants realised that they were ‘not invincible’ (06, male, 34 years) and considered that they had a ‘physical capital’ (03, female, 42 years) that they sacrificed for their art but that this deteriorated over time because of their circus disciplines and advancing age:

“It's just another stone, another little pebble each time, and after a while you start to realise that you're carrying quite a lot [...]. But they've not stopped me yet.” (04, male, 31 years)

Therefore, participants explained the importance of taking care of their bodies, a process learned by experiencing injuries which implied optimising training and seeking-help more often in order not to cut short their career:

“If you don't go and get help, then [...] you're not going to be able to carry on... keep going, if you're completely broken.” (06, male, 34 years)

This was also acknowledged by less experienced participants:

“I'm definitely aware of, when I'm performing, to not do anything that might impinge on my career” (08, male, 27 years)

One participant acknowledged the negative effects of growing older and described how the life of a circus artist typically changes through a circus career:

“When you're young, you're the acrobat [...], as you get older, eventually you [...] become a clown, or stack the chairs, sell the candy floss.” (04, male, 31 years)

This participant occasionally stopped rehabilitation after an injury knowing that it would be impossible to reverse the process:

“There is no point in trying to do something that's never gonna come, cut it.” (04, male, 31 years)

2) Professionalism

Situational factors associated with the show influenced participants behaviour. Most held the view that the performance or show should take precedence over any personal issues or injuries they may have.

2.1 The pressure to perform

The pressure to perform applied by circus companies varied and depended on artists' employment status. Some employers valued their artists:

“you always knew you could just go and seek help if you wanted, with no repercussions, no ‘no show no money’.” (02, female, 34 years)

Other companies encouraged artists to prioritise the show and their performance above individual issues and to continue performing regardless of injuries:

“There was no leeway. So the next day I was back there doing... my show and training, with broken ribs... which was really painful.” (02, female, 34 years)

This pressure was compounded in some cases as there were also financial pressures to continue performing because not working meant not being paid or losing their job. This encouraged artists to perform despite injury:

“So you then go and say: ‘well actually I've got this problem’? How dare you when he'll tell you you'll be replaced tomorrow?” (02, female, 34 years)

The participant employed in a traditional circus agreed with this because his employer also had financial difficulties:

“Obviously her salary was cut, we couldn't afford to pay her for nothing”. (09, male, 27 years)

Overall permanently employed artists reported less external pressure than self-employed participants, however, all participants, regardless of their demographics and work characteristics, applied pressure to perform on themselves. They perceived cancelling or not finishing a show as ‘failing’, did not want to let their peers and employers down, and wanted to ‘keep their promises’. The show was considered as ‘all that matters’:

“The performance is the most important thing we have. It’s the biggest capital we have.” (03, female, 38 years)

A few participants continued to perform because they believed their life would deteriorate if they stopped. One participant who had little pressure from his employer reported:

“There’s no light at the end of the tunnel [if you don’t perform], you’ve got nothing to go and to distract yourself.” (06, male, 34 years)

One participant admitted that he stopped working when injured as he felt that his health was more important than performing:

“That’s really, really hard to do. But at the same time... there were times when it demands it [...] and que sera sera you know, there’ll be other shows.” (04, male, 31 years)

2.2 Adapting to perform

All participants perceived pain and injuries as extremely common. Some participants who had limited access to healthcare professionals, reported that distinguishing ‘bad’ pain (which may be associated from an injury) with ‘good’ pain (e.g. from muscle fatigue) as hard:

“You can’t differentiate between pain that is bad for you and pain that’s good for you [...] ‘cause a lot of the time everything hurts. Um, you have to figure out whether that’s just muscular fatigue or from developing something really bad.” (08, male, 27 years)

All interviewees considered working with pain was part of the job and something which they adapted to. Consequently, participants differentiated ‘big’ and ‘small’ injuries depending their ability to practice circus:

“A big injury is one that means that I can’t train, or I have to severely limit how I train.” (10, male, 28 years)

They expressed a sense of pride in continuing to work despite injury and did not want to admit any physical or emotional distress to the audience and other performers. Some participants used pain medication because they were perceived as invisible to the audience:

“[I take] a lot of pain killers before going on the stage, ‘um because it means that you can still smile.” (04, male, 31 years)

Others commented that their pain dissipated during shows which made them ‘forget about their bodies’:

“I had adrenaline from the performance, and I smiled and carried on... with broken ribs.” (02, female, 34 years)

Some participants reported that they were impervious to pain due to overuse injuries:

“In a similar way that the soldier breaks bones in his feet without knowing, because he marches a lot, I break bones on my hands because I palm them in the floor a lot.” (04, male, 31 years)

One participant explained that she adapted her act and developed creativity to ‘work around’ their body’s limitations to minimise the impact of their injuries. She expanded that this was made possible because circus is an art, so it does not have fixed execution criteria:

“okay if that hurts, let's just not do it, let's just do another move because it doesn't really matter for the audience. It's not sports, we don't get ticked. You know we don't get given a score, yeah, but so you know we have creative freedom.” (01, female, 39 years)

Males and females justified their attitude to injury by their strong personalities, others because of their training as gymnast before they started circus. One participant raised in a circus family reported that it was the result of her upbringing:

“I have been brought up to be quite tough” (02, female, 34 years)

Others confessed a certain denial about their injuries and they regretted later in their career how they initially managed injuries:

“I was very stupid and young basically, just trying to kind of will myself back to health, rather than actually admitting that I was really broken.” (04, male, 31 years)

3) Circus life

The participants’ injury management and attitudes were partly determined by the unique circumstances and situational factors associated with working as a circus artist.

3.1 Life on tour

All participants perceived circus as a challenging job, regardless of where they were employed.

Participants eloquently described the continuous nature of circus life, intense schedules comprising constant travelling, high number of shows and daily training sessions, in addition to other responsibilities such as the circus set up, costume production or teaching. They perceived that this increased their injury risk and made it harder for them to manage their injuries or seek help:

“You’ll be performing two or three days, and then the day after you’ll be taking down the structure, and then you’ll be hitting the road for one or two days, that’s your time to rest.” (08, male, 27 years)

The participant employed in a traditional circus did not have a fixed address, which restricted his access to health facilities and made it harder for them to attend treatment:

“My address is a post office box, because actually I live in a caravan.” (09, male, 27 years)

Whilst emergency departments were readily accessible, the presence of onsite healthcare professionals was rare and many participants could not often seek help for minor injuries as they were constantly travelling and therefore not registered with or had access to a General Practitioner:

“How do you go to the hospital with a pulled muscle? They just laugh at you and send you away.” (02, female, 34 years)

Language barriers also restricted some participants’ access to healthcare, if needed, when performing in a foreign country:

“You don’t wanna go to accident and emergency in Spain where you can’t even speak the language.” (02, female, 34 years)

3.2 The need for self-management

Access or not to a medical team influenced the experience and behaviour of participants. A few

participants explained that some larger companies provided help or financial support to injured performers. This was uncommon, but most participants seized this opportunity if it was available:

“They had a physio in-house [...], when you have the opportunity to find something like that it’s invaluable, really”. (08, male, 27 years)

For self-employed participants, and especially in traditional circus, the need for self-management was recognised:

“There’s no one to take care of you, it’s the artist’s job to take care of the artist in traditional circus.” (09, male, 27 years)

Many self-employed participants discussed self-management strategies. They explained how they relied on their own experience, searched for guidelines on the Internet to manage their injuries or waited for them to resolve themselves:

“When I pack my suitcase [...], I take my own medical kit. You know what you need [...]. Yeah you learn to be your own physio.” (02, female, 34 years)

Some participants actively sought advice from other performers about injuries:

“We do have quite a wealth of knowledge without having to go directly to physios.” (04, male, 31 years)

They reported that helping peers was considered typical behaviour in circus:

“We kind of look out for each other a bit. Um, we don’t make a big fuss about it.” (10, male, 28 years)

Conversely participants with access to healthcare professional more frequently distrusted their peers' advice as they felt that they did not have appropriate knowledge:

“We’re all making it up, you know?” (09, male, 27 years)

A few participants expressed that they were less likely to prioritise their health when they are touring. They attributed this to fatigue associated with performing and travelling, and to being in an unfamiliar and unpredictable environment, where what mattered was the audiences' satisfaction:

"Your mind is slightly in a different place you know." (01, female, 39 years)

4) Artists' experiences of healthcare

Overall, interviewees reported that they required personalised and specialised healthcare when injured but that this was not always available. They reported mixed experiences of treatment and recommended improvements to service provision.

5.1 Knowledgeable healthcare professionals

All participants valued an empathetic healthcare professional that had a holistic understanding of their needs and situation, the importance of their bodies, their circus discipline and workload:

"He seems to really understand that I don't just need to be able to function in day to day life. I need to be able to push my body really hard [...]. His interests were aligned with mine."
(10, male, 28 years)

They also favoured healthcare professionals considering their financial constraints and their goals. Most participants appreciated the self-management techniques recommended by therapists such as home-exercises. They valued that therapists recognised that stopping or resting was not possible and that help was needed to find adaptive strategies:

"He was working with you to get you back into the job. That was really a great thing about him." (02, female, 34 years)

Conversely, a few participants criticized the public healthcare service:

"I just don't have faith in the... medical system really. You know, I do feel like they sort of let me down." (05, female, 42 years)

They did not feel their profession, injuries and needs were universally understood:

“It felt like you just would talk another language with them and they wouldn't understand... fully understand your needs. Coz you know it is a different world.” (01, female, 39 years)

Some participants recognized the need for education for healthcare professionals but complained that research on circus arts was rare:

“In other disciplines or sports, they're already like ten million years... you know ahead with the research and the services that they can provide.” (01, female, 39 years)

5.2 Accessibility of healthcare

Circus artists employed by larger contemporary companies offering on-site, travelling health care had greater access to help. This is an opportunity that they seized:

“During the week when I did my shoulder they said, “don't worry about it, just mark the position, just be there and we'll organize physio for you the next day.” (06, male, 34 years)

Conversely, artists employed in a more traditional circus, self-employed or employed in companies with no medical team reported that they were generally not satisfied with the availability of healthcare services for circus artists. They generally favoured more expensive private specialists recommended by peers:

“You get what you pay for at the end of the day”. (07, female, 31 years)

One self-employed participant with little financial capacity reported a good experience with a therapist that offered him a free examination:

“[a first free consultation] just takes so much... stress and pressure out of it [...]. Um, because you don't have to check whether you can afford your rent the next month.” (10, male, 28 years)

Due to the itinerant nature of their lives, many participants reported that they could often not attend appointments or return for a follow-up. They were frustrated by the delay when seeing a therapist in the public health system. They did not want to wait to have injuries diagnosed and wanted priority:

“If you need your body to work, you should be top of the list”. (03, female, 42 years)

Participants unanimously wanted affordable and better healthcare, particularly a fast-track diagnosis system in order to be back to work quicker:

“Scans, which can help you to know exactly what is wrong with your body before it gets to a point where it’s completely broken, um, I think that needs to be available and easy to obtain with a tight schedule.” (08, male, 27 years)

One participant could afford medical insurance which allowed him to have rapid access to high quality care. Other participants stated that they could not pay for insurance policies or treatment:

“I couldn’t afford to have every injury I’ve had diagnosed [...], then a follow up treatment [...], I need to save money.” (09, male, 27 years)

Interviewees were generally eager for easily accessible information about emergency first aid, prevention, injury management, their rights when injured and the available help. They mentioned the importance of sharing health advice among circus artists and suggested that information could be shared online so that it could be ‘easy to access from anywhere’.

4. Discussion

Four overarching themes were identified: 1) The injured artist, 2) Professionalism, 3) Circus life and 4) Artists’ experience of healthcare. These themes could be broadly explained by the concept of ‘athletic identity’ (28) and Wiese-Bjornstal’s model (26) (figure 1).

All participants, no matter their demographic characteristics expressed the view that circus was everything to them and when they were injured it affected them physically, psychologically and socially, confirming earlier work (39). Circus was considered an intrinsic part of participants’ identity, which is similar to other sports or performing arts such as ballet, where there is an intimate connection between self and career (11, 28, 29). Participating in sport is described as crucial for athletes’ identity and a way for them to express who they are and how they want others think of them (28, 29). This mirrors our findings in theme 1, as circus artist reported that

circus was their whole life and that there were strong links between how participants viewed themselves and circus.

In sports people the notion of ‘athletic identity’ provides a framework for interpreting information, determines how an athlete copes with career-threatening situations, and inspires behaviour consistent with the athlete role (28). As athletes (23, 40), ballet dancers (12) and musicians, (19) participants in this study accepted that pain was normal and reported a strong sense of professionalism (theme 2). In different work settings, and even when help was freely available, participants used strategies described in other performing artists to perform when injured, such as ignoring pain and self-medicating to diminish the effects of injury (12). Participants felt that it was their duty to adapt so that the show could go on, or at least go back to work as soon as possible. Compared to employees with long-term contracts, self-employed and traditional circus artists were more often pushed to perform by their company and their financial situation, although participants felt that the decision to perform through pain was their own. Like dancers (12), participants were proud of their capacity to perform when in pain, which was key to their identity as a artists.

Athletic identity also has a social role in that it may be determined by the perceptions of the athlete’s social circle (family, friends, coach) (27). Our findings suggest that circus artists consider circus as their whole world and value the circus community. Therefore, injuries which affect their ability to perform threatened their belonging in the community. This reflects the findings in other performing arts such as ballet and music, where the affective role of community in ballet companies and orchestras sustains the vocation of its artists (11-13). Identity may also define the way in which an individual evaluates their competence or worth, which may influence self-esteem, affect and motivation (28). When participants were unable to train or perform, some withdrew from the circus community until they could resume their role as artists, therefore guaranteeing that they are considered by others as artists, not as injured individuals. Reduced physical fitness was identified as the cause of progressive performance decline in most sports which may affect career duration (23, 41). Participants were eager to extend their career, which maintains their identity as circus artists. To do so, they took care of their bodies, they adapted their performances when injured, or they stayed involved in circus arts by assuming other roles such as teaching.

Participants reported that the relentless workload whilst touring limited rest time in theme 3, which may be important for maintaining health and injury management. Low self-efficacy (self-confidence), high fatigue (time pressure, over fatigue) and emotional exhaustion are associated with up to a threefold increase in injuries in artists in Cirque Du Soleil (5). The addition of at least two days rest per four–six weeks of touring reduced injury rate (7) which provides preliminary data on the possible role of cumulative fatigue and psychosocial factors on injury risk in circus artists. The recent death of an experienced Cirque Du Soleil acrobat during a show, together with two similar previous events (42), highlights that protective measures may be needed. Our participants reported varied experiences of seeking help from healthcare professionals. Some participants reported negative experiences of healthcare which made them dissatisfied. This may explain why some circus artists have low trust in healthcare providers (9) and reported low injury rates (8). Participants emphasised the necessity for educating healthcare professionals about the specific needs of circus artists and specialised centres of excellence may be needed. Online services (43, 44) or other remote access services might offer to flexibility to accommodate the transient nature of circus life. Finally, the development of targeted and affordable insurances might allow artists rapid access to expertise advice and management if injured.

Wiese-Bjornstal's model (26) provides a framework to better understand the different features of circus artists' experiences of injuries. Performance was central to participants' cognitive appraisal, and this influenced how they perceived key aspects of this model: injury characteristics, individual psychological and demographic differences and the situational factors. For example, participants graded injuries depending on how these would affect the show, similar to dancers (45). If they were on tour, they neglected their pain so that the show could go on. Similarly, professional footballers prioritized their teams' needs above their own (23). These appraisals subsequently affect emotional responses and behavior (22). For example, situational factors such as appropriate help and support provided by companies lead participants to report better injury experiences. While providing circus artists with strategies for self-care and prevention might be a short-term solution, this model suggests that better regulations of the profession and circus company responsibilities are needed so that help can be more readily available for injured circus artists. This model also illustrates how major injuries deeply affects emotional states of participants and can lead to feelings such as fear, depression, boredom and frustration, as observed in sport psychology (23, 24, 40) and performing arts (12-14).

INSERT FIGURE 1 HERE

Figure 1. Individual response to circus injury (modified from Walter et al., 2007a and Wiese-Bjornstal et al., 1998). The clockwise arrows indicate how cognitive appraisals affect emotions, which in turn affect behaviour. The arrows should be viewed as a 3D spiral heading in an upward direction towards recovery, or in a downward direction away from recovery. (Modifications of the original model are shown in italics.)

The dynamic core of the model should be viewed as a three-dimensional spiral that heads in an upward direction towards recovery, or a downward direction away from recovery. This can help to understand how the consequences of injuries, professionalism, circus culture and artists' experiences of healthcare influenced the participants' experiences of injury, both positively and negatively. For example, negative emotions, which are risk factors for the persistence of musculoskeletal disorders (46) might be ameliorated by adequate peer and medical support. Similarly, it was recognized that injured musicians are deeply affected by their environments, the organisational culture, behavioural norms and psychosocial factors (15, 18, 19).

Our study includes many of the model's features, but some additional factors were identified by participants. These were for example: *beliefs about pain and injury*, *adaptive strategies* utilised by circus artists to enable them to perform, specific emotions (*self-blame and self-hate*), and the behaviour of *information gathering*. Situational factors (*role in the show, finance status, work schedule, circus culture*), illustrate the importance of the circus artist's *experience of previous injuries*, and the concept of *artistic identity* as it played a major role for participants. Many of these factors are not unique to circus artists and their understanding might be applicable to other performers. Furthermore, adaptations to terminology allow this model to explain better the experiences of circus arts e.g *sport* section was amended to *circus discipline*. Some components such as *scholarship status* were removed as it did not apply to our study's population.

This study has several strengths. Thematic analysis is an adaptable tool to collect broad, rich and complex data which can then be rigorously and interpretatively analysed (36). Different steps were followed to increase the rigour of the study: data saturation of themes was reached; the interview guide was piloted and revised iteratively, and quotes and counter quotes reported in the findings to minimise bias. Accuracy of transcripts was checked by participants

three researchers (TC, LB and EG) reflected and agreed on the final themes. The resonance of the study findings was explored with three participants.

This study had some limitations. Timing can influence the participants' reports of their injuries, so that the retrospective nature of this study may put it at risk of recall bias (47). However, speaking about past experiences may be beneficial as it provides time to better appraise and process experiences. Furthermore, most participants also discussed current injuries, which were less susceptible to this bias. Whilst themes were drawn from the data, beliefs derived from the researcher's circus and physiotherapy background have influenced the interviews. The lead authors experience in managing circus artists' musculoskeletal complaints and experiencing circus-induced injuries personally may have helped to nurture an empathic relationship with the participants. Measures were taken to recognise these influences and to approach the interviews with open-mindedness, but in a constructivism framework, the researcher's experiences and subjectivity remain and are an integral part of the research process (30). Circus artists may have responded differently to a researcher not involved in those fields, but we believe that the researcher's background helped develop trust and may have deepened the understanding and interpretation of the data.

5. Conclusion

This is the first study to explore professional circus artists' views of injury and help seeking. Injuries have wide-ranging physical and psychosocial consequences on circus artists who view the circus as their whole world. Consequently, their identity is threatened by injuries, which are often inadequately managed. Despite injury, artists continue to perform due to internal and external pressures, this may be explained because they believe that pain is normal and that they need to adapt to injuries, because the show is what matters, and because performing is crucial to their identity. Wiese-Bjornstal's model provides a framework to understand the emotional and behavioural response to injuries, based on circus specific situational and personal factors.

The health of circus artists might be improved by developing flexible and more accessible approaches to injury prevention and management. This could involve online resources, educating healthcare providers and circus artists about injury management, developing centres of expertise and appropriate regulation of the profession.

6. References

1. Circus Manuals [webpage]. European Federation of Professional Circus Schools; [cited 2018 26/01/2018]. Available from: <http://www.fedec.eu/en/articles/513-manuals>.
2. Shrier I, Meeuwisse WH, Matheson GO, Wingfield K, Steele RJ, Prince F, et al. Injury patterns and injury rates in the circus arts: an analysis of 5 years of data from Cirque du Soleil. *The American journal of sports medicine*. 2009;37(6):1143-9. doi: 10.1177/0363546508331138. PubMed PMID: 19286913.
3. Wanke EM, McCormack M, Koch F, Wanke A, Groneberg DA. Acute injuries in student circus artists with regard to gender specific differences. *Asian journal of sports medicine*. 2012;3(3):153-60. PubMed PMID: 23012634; PubMed Central PMCID: PMC3445642.
4. Shrier I, Raglin JS, Levitan EB, Mittleman MA, Steele RJ, Powell J. Procedures for assessing psychological predictors of injuries in circus artists: a pilot prospective study. *BMC Med Res Methodol*. 2014;14:77. doi: 10.1186/1471-2288-14-77. PubMed PMID: 24920527; PubMed Central PMCID: PMC4064279.
5. Shrier I, Halle M. Psychological predictors of injuries in circus artists: an exploratory study. *British journal of sports medicine*. 2011;45(5):433-6. doi: 10.1136/bjsm.2009.067751. PubMed PMID: 21047839.
6. Guillaume Agnesina NT, Redha Taïar, M'hamed Mostefaoui, Alexandre Del Perugia. Analyse biomécanique chez l'artiste de cirque pour l'activité du cadre aérien. 18ème Congrès Français de Mécanique. 2007.
7. Orlando C, Levitan EB, Mittleman MA, Steele RJ, Shrier I. The effect of rest days on injury rates. *Scandinavian journal of medicine & science in sports*. 2011;21(6):e64-71. doi: 10.1111/j.1600-0838.2010.01152.x. PubMed PMID: 20561270.
8. Wolfenden HE, Angioi M. Musculoskeletal Injury Profile of Circus Artists: A Systematic Review of the Literature. *Medical problems of performing artists*. 2017;32(1):51-9. Epub 2017/03/11. doi: 10.21091/mppa.2017.1008. PubMed PMID: 28282479.
9. Long AS, Ambegaonkar JP, Fahringer PM. Injury reporting rates and injury concealment patterns differ between high-school cirque performers and basketball players. *Medical problems of performing artists*. 2011;26(4):200-5. PubMed PMID: 22211196.
10. Arastu MH, Grange S, Twyman R. Prevalence and consequences of delayed diagnosis of anterior cruciate ligament ruptures. *Knee surgery, sports traumatology, arthroscopy : official journal of the ESSKA*. 2015;23(4):1201-5. Epub 2014/03/29. doi: 10.1007/s00167-014-2947-z. PubMed PMID: 24671385.
11. Wainwright SP, Williams C, Turner BS. Fractured identities: injury and the balletic body. *Health*. 2005;9(1):49-66. doi: 10.1177/1363459305048097. PubMed PMID: 15576424.
12. McEwen K, Young K. Ballet and pain: reflections on a risk-dance culture. *Qualitative Research in Sport, Exercise and Health*. 2011;3(2):152-73. doi: 10.1080/2159676X.2011.572181.
13. Zaza C, Charles C, Muszynski A. The meaning of playing-related musculoskeletal disorders to classical musicians. *Social science & medicine*. 1998;47(12):2013-23. PubMed PMID: 10075243.

14. Schoeb V, Zosso A. "You cannot perform music without taking care of your body": a qualitative study on musicians' representation of body and health. *Medical problems of performing artists*. 2012;27(3):129-36. PubMed PMID: 22983130.
15. Rickert DL, Barrett MS, Ackermann BJ. Injury and the orchestral environment: part I. The role of work organisation and psychosocial factors in injury risk. *Medical problems of performing artists*. 2013;28(4):219-29. Epub 2013/12/18. PubMed PMID: 24337034.
16. Guptill C. The lived experience of working as a musician with an injury. *Work*. 2011;40(3):269-80. doi: 10.3233/WOR-2011-1230. PubMed PMID: 22045533.
17. Guptill CA. The lived experience of professional musicians with playing-related injuries: a phenomenological inquiry. *Medical problems of performing artists*. 2011;26(2):84-95. PubMed PMID: 21695356.
18. Rickert DL, Barrett MS, Ackermann BJ. Injury and the orchestral environment: part III. the role of psychosocial factors in the experience of musicians undertaking rehabilitation. *Medical problems of performing artists*. 2014;29(3):125-35. Epub 2014/09/07. PubMed PMID: 25194109.
19. Rickert DL, Barrett MS, Ackermann BJ. Injury and the orchestral environment: part II. Organisational culture, behavioural norms, and attitudes to injury. *Medical problems of performing artists*. 2014;29(2):94-101. Epub 2014/06/14. PubMed PMID: 24925177.
20. Barrault D. La médecine du cirque. *Science & Sports*. 2014;29(2):104-9. doi: <http://dx.doi.org/10.1016/j.scispo.2014.02.001>.
21. Goudard P, Perrin P, Boura M. Interet du calcul de la charge de travail pendant l'apprentissage des Arts du Cirque. The interest in evaluating the work load of circus performers. *Cinesiologie*. 1992;31:141-9.
22. Walker N, Thatcher J, Lavallee D. Psychological responses to injury in competitive sport: a critical review. *J R Soc Promot Health*. 2007;127(4):174-80. PubMed PMID: 17711063.
23. Hammond LE, Lilley JM, Pope GD, Ribbans WJ, Walker NC. 'We've just learnt to put up with it': an exploration of attitudes and decision-making surrounding playing with injury in English professional football. *Qualitative Research in Sport, Exercise and Health*. 2013;6(2):161-81. doi: 10.1080/2159676X.2013.796488.
24. Evans L, Wadey R, Hanton S, Mitchell I. Stressors experienced by injured athletes. *Journal of sports sciences*. 2012;30(9):917-27. doi: 10.1080/02640414.2012.682078. PubMed PMID: 22551525.
25. Grindstaff JS, Wrisberg CA, Ross JR. Collegiate athletes' experience of the meaning of sport injury: a phenomenological investigation. *Perspect Public Health*. 2010;130(3):127-35. PubMed PMID: 20642129.
26. Wiese-bjornstal DM, Smith AM, Shaffer SM, Morrey MA. An integrated model of response to sport injury: Psychological and sociological dynamics. *Journal of Applied Sport Psychology*. 1998;10(1):46-69. doi: 10.1080/10413209808406377.
27. Brewer BW, Van Raalte JL, Linder DE. Athletic identity: Hercules' muscles or Achilles heel? *International Journal of Sport Psychology*. 1993;24(2):237-54.
28. Sparkes AC. Athletic Identity: An Achilles' Heel to the Survival of Self. *Qualitative health research*. 1998;8(5):644-64. doi: 10.1177/104973239800800506.
29. Allen Collinson J, Hockey J. 'Working Out' Identity: Distance Runners and the Management of Disrupted Identity. *Leisure Studies*. 2007;26(4):381-98. doi: 10.1080/02614360601053384.

30. Petty NJ, Thomson OP, Stew G. Ready for a paradigm shift? Part 1: introducing the philosophy of qualitative research. *Manual therapy*. 2012;17(4):267-74. doi: 10.1016/j.math.2012.03.006. PubMed PMID: 22480950.
31. Robinson OC. Sampling in Interview-Based Qualitative Research: A Theoretical and Practical Guide. *Qualitative Research in Psychology*. 2014;11(1):25-41. doi: 10.1080/14780887.2013.801543.
32. Francis JJ, Johnston M, Robertson C, Glidewell L, Entwistle V, Eccles MP, et al. What is an adequate sample size? Operationalising data saturation for theory-based interview studies. *Psychology & health*. 2010;25(10):1229-45. Epub 2010/03/06. doi: 10.1080/08870440903194015. PubMed PMID: 20204937.
33. Galea Holmes MN, Weinman JA, Bearne LM. 'You can't walk with cramp!' A qualitative exploration of individuals' beliefs and experiences of walking as treatment for intermittent claudication. *Journal of health psychology*. 2017;22(2):255-65. Epub 2015/09/10. doi: 10.1177/1359105315600238. PubMed PMID: 26349613.
34. Bearne LM, Manning VL, Choy E, Scott DL, Hurley MV. Participants' experiences of an Education, self-management and upper extremity eXercise Training for people with Rheumatoid Arthritis programme (EXTRA). *Physiotherapy*. 2017;103(4):430-8. doi: <https://doi.org/10.1016/j.physio.2016.12.002>.
35. Igwesi-Chidobe CN, Kitchen S, Sorinola IO, Godfrey EL. "A life of living death": the experiences of people living with chronic low back pain in rural Nigeria. *Disability and rehabilitation*. 2017;39(8):779-90. Epub 2016/04/26. doi: 10.3109/09638288.2016.1161844. PubMed PMID: 27111492.
36. Braun V, Clarke V. Using thematic analysis in psychology. *Qualitative Research in Psychology*. 2006;3(2):77-101. doi: 10.1191/1478088706qp0630a.
37. Kathy C. Grounded Theory in Global Perspective: Reviews by International Researchers. *Qualitative Inquiry*. 2014;20(9):1074-84. doi: 10.1177/1077800414545235.
38. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International journal for quality in health care : journal of the International Society for Quality in Health Care*. 2007;19(6):349-57. Epub 2007/09/18. doi: 10.1093/intqhc/mzm042. PubMed PMID: 17872937.
39. Goudard P. Arts du cirque, arts du risque : instabilité et déséquilibre dans et hors la piste 2005.
40. Mosewich AD, Crocker PRE, Kowalski KC. Managing injury and other setbacks in sport: experiences of (and resources for) high-performance women athletes. *Qualitative Research in Sport, Exercise and Health*. 2013;6(2):182-204. doi: 10.1080/2159676X.2013.766810.
41. Kelman BB. Occupational hazards in female ballet dancers. Advocate for a forgotten population. *AAOHN journal : official journal of the American Association of Occupational Health Nurses*. 2000;48(9):430-4. Epub 2002/01/05. PubMed PMID: 11760290.
42. Allen J. Cirque du Soleil performer dies after falling in front of audience. *The Telegraph*. 2018 19/03/2018.
43. The GP Service [webpage]. The GP Service (UK); [cited 2018 26/01/2018]. Available from: <https://www.thegpservice.co.uk>.
44. Push Doctor [webpage]. Push Dr; [cited 2018 26/01/2018]. Available from: <https://www.pushdoctor.co.uk>.

45. Thomas H, Tarr J. Dancers' perceptions of pain and injury: positive and negative effects. *Journal of dance medicine & science : official publication of the International Association for Dance Medicine & Science*. 2009;13(2):51-9. PubMed PMID: 19508809.
46. Hartvigsen J, Hancock MJ, Kongsted A, Louw Q, Ferreira ML, Genevay S, et al. What low back pain is and why we need to pay attention. *The Lancet*. doi: 10.1016/S0140-6736(18)30480-X.
47. Gabbe BJ, Finch CF, Bennell KL, Wajswelner H. How valid is a self reported 12 month sports injury history? *British journal of sports medicine*. 2003;37(6):545-7. Epub 2003/12/11. PubMed PMID: 14665599; PubMed Central PMCID: PMC1724702.

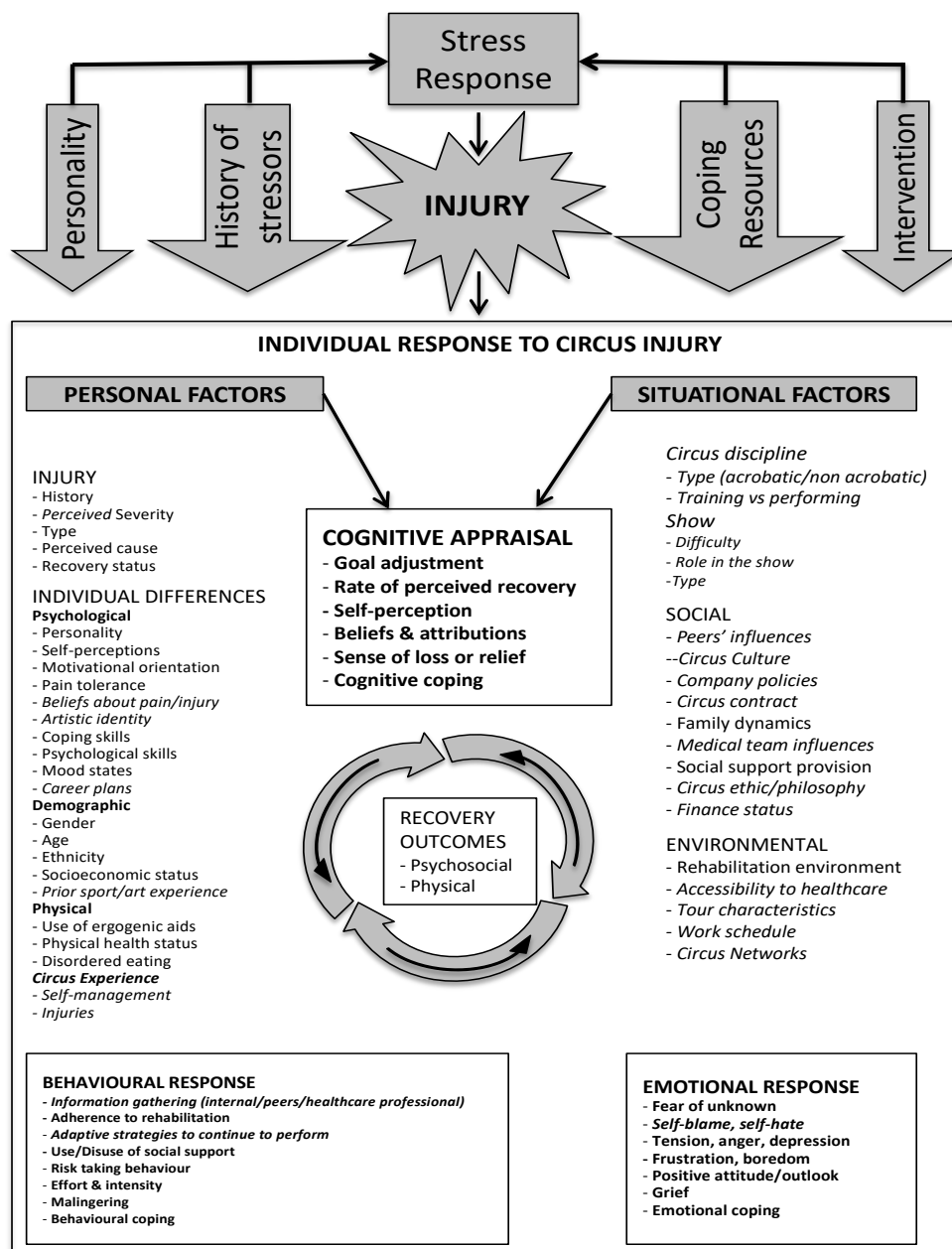


Figure 2. Individual response to circus injury (modified from Walter et al., 2007a and Wiese-Bjornstal et al., 1998). The clockwise arrows indicate how cognitive appraisals affect emotions, which in turn affect behaviour. The arrows should be viewed as a 3D spiral heading in an upward direction towards recovery, or in a downward direction away from recovery. (Modifications of the original model are shown in italics.)

Table 1. Topic guide summary

- *How long have you been a circus performer and what are your main circus disciplines?*
- *Please tell me about your experiences of circus-related injuries?
(minor, severe, recurrent?)*
- *How have you coped with injuries during your career?
(coping strategies, pacing/rest/concealment, self-management)*
- *How do they affect you?
(performance, life, career, relation with peers/employer)*
- *Do you seek help when you get injured?*
- *If no, why not?*
- *If yes, what kind of help and from where?
(from whom, where?)*
- *What are your experiences of seeking-help?
(experiences with medical, allied health professionals, what is helpful and not so helpful?)*
- *What kind of support or help do you believe could improve how performing artists are dealing with performance-related injury and pain?*
- *Is there anything else you would like to say?*

Table 2. Socio demographic and professional characteristics of participants

Participant ID Sex age (years)	Circus practice (years)	Circus Speciality (hours of practice /week)	Current injuries	Work characteristics	Medical insurance
01 Female 39	19	Acro-balance (25)	Chronic left ankle instability and recurrent right shoulder pain.	Employed in a Contemporary trio and teaching in a professional circus school.	No
02 Female 34	28	Aerials (28)	Chronic shoulder and back pain.	Self-employed working in a contemporary duo with her partner. Born and raised in a circus family.	No
03 Female 38	15	Acro-balance (15)	Chronic back pain	Teacher in a professional circus school and company director. Used to perform in a trio but stopped performing as an acrobat since 5 years due to pain.	No
04 Male 31	13	Cyr wheel, Fire (20)	Recurrent wrist, back, hip, ankle and lung pain.	Self-employed. Touring with a solo contemporary act.	No
05 Female 42	20	Hula hoop, Aerials, Fire, Rollerskating (15)	Just recovered from an acute knee injury. Recurrent ankle, neck and shoulder pain.	Self-employed. Performs in a wide range of events (e.g. cabaret, birthdays,).	No
06 Male 34	1	Acrobatics (30)	Recurrent shoulder, knee and ankle pain. Acute adductor and elbow pain.	Self-employed. Gymnast now performing in a U.K. contemporary company	Yes
07 Female 31	10	Flying trapeze flyer and catcher, Aerials (30)	Recently recovered from a severe back injury. Recurrent wrist and hamstring pain.	Self-employed. Performer and teacher in a London based middle sized contemporary company.	Yes
08 Male 27	7	Aerial catcher (25)	Recurrent shoulder pain and pain related to previous back and knee injuries.	Self-employed. Working in two middle sized contemporary companies	No
09 Male 27	6	Flying trapeze, Trampoline (24)	Acute elbow injury and multiple bruises. History of wrist pain due to a fracture.	Self-employed. Left his job as a school teacher to become an artist in a traditional circus	No
10 Male 28	6	Hand-to-hand catcher (30)	Lower back and neck recurrent pain. Recent thumb sprain.	Self-employed. Working in a contemporary duo.	No